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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,631	09/29/2003	Shashank C. Deshmukh	8233/ETCH/SILICON/JB	4703
55649	7590	10/04/2006	EXAMINER	
MOSER IP LAW GROUP / APPLIED MATERIALS, INC. 1040 BROAD STREET 2ND FLOOR SHREWSBURY, NJ 07702			UMEZ ERONINI, LYNETTE T	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 10/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Advisory Action  
Before the Filing of an Appeal Brief**

Application No.

10/674,631

Applicant(s)

DESHMUKH ET AL.

Examiner

Lynette T. Umez-Eronini

Art Unit

1765

**--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

THE REPLY FILED 06 September 2006 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☐ The period for reply expires \_\_\_\_\_ months from the mailing date of the final rejection.  
b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**NOTICE OF APPEAL**

2. ☐ The Notice of Appeal was filed on \_\_\_\_\_. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

**AMENDMENTS**

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because  
(a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);  
(b) ☐ They raise the issue of new matter (see NOTE below);  
(c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or  
(d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).  
5. ☐ Applicant's reply has overcome the following rejection(s): \_\_\_\_\_.  
6. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).  
7. ☐ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.  
The status of the claim(s) is (or will be) as follows:  
Claim(s) allowed: none.  
Claim(s) objected to: none.  
Claim(s) rejected: 1-21, 42 and 43.  
Claim(s) withdrawn from consideration: 32-41.

**AFFIDAVIT OR OTHER EVIDENCE**

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).  
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).  
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

**REQUEST FOR RECONSIDERATION/OTHER**

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:  
See Continuation Sheet.  
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). \_\_\_\_\_.  
13. ☐ Other: \_\_\_\_\_.

NADINE WONTON  
SUPERVISORY PATENT EXAMINER  
ART UNIT 1765  
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Continuation of 11. does NOT place the application in condition for allowance because:

Applicants arguments filed 9/6/2006 have been fully considered but they are not persuasive. Applicants traverse the 112(1) rejection of claims 1-21, 42, and 43 as failing to provide support for "wherein the pre-selected wavelength in nanometers is greater than or on the order of the initial thickness of the initial thickness of the material in Angstroms" lacks support in the Specification [0018]. Applicants argue that support for the said limitation is found in [0018 and 0028].

Applicants' arguments are unpersuasive because the Specification fails to fully disclose wherein the pre-selected wavelength in nanometers is greater than the initial thickness of the initial thickness of the material in Angstroms.

Applicants traverse the rejection of claims 1- 5, and 7-10; 11,12, 15, 16, and 18-21, under 35 U.S.C. § 102(b) as being anticipated by Lee (US 5,825,221). Applicants argue Lee fails to disclose "wherein the pre-selected wavelength in nanometers is greater than or on the order of the material layer in Angstroms" as recited in claim 1 and "wherein the pre-selected wavelength in nanometers is greater than or on the order of the initial thickness of the gate dielectric layer in Angstroms" as recited in claim 11.

Applicants' argument is acknowledged but is unpersuasive because Lee discloses a substrate surface comprises a 1500 Å (~150 nm) oxide (same as Applicants' high-k dielectric material layer and high-k gate dielectric layer) that is etched at 2.0 eV, 2.8 eV, 3.3 eV, and 4.0 eV (~ 620 nm or 6200 Å, 443 nm or 4430 Å, 376 nm or 3760 Å, and 310 nm or 3100 Å). Lee also discloses an oxide mask having a thickness of 1000 to 2000 Å (100-200 nm), 1000 Å thick titanium nitride formed over a 2000 Å (200 nm), polysilicon film and 70 Å (7 nm), thick gate oxide (column 7, lines 38-50). Table A below shows the pre-selected wavelength in nanometers is greater than or on the order of the initial thickness of the material layer in Angstrom.

Table A. Comparison of Preselected Wavelengths in nm to Intensity of Initial Thickness of High-k Dielectric Material to be Etched in Angstroms.

Preselected Wavelength, eV	2	2.8	3.3	4.0
nm	620	443	376	310
Thickness of high-k dielectric, Å	1000-2000	1000-2000	1000-2000	1000-2000

Applicants traverse the rejection of claims 3, 14, 42, and 43 as being unpatentable over Lee (US '221) in view of Grimbergen (US 6,406,924 B1) as failing to teach the thickness of the material (gate dielectric) layer is 5 to 300 Angstroms and 20 to 100 Angstroms (See Remarks, page 10 of 13).

Applicants' arguments are acknowledged and unpersuasive because Lee teaches etching a silicon oxide mask (same material as Applicants' high-k (gate) dielectric), which has a thickness between 1000-2000 Å (~ 100 nm to 200 nm), (column 7, lines 38-50). Applicants have failed to show there is an unexpected result in etching a high-k dielectric layer, even though the material might serve a different function.

Applicants' arguments, see Remarks, filed 9/6/2006, with respect to the rejection(s) of claim(s) 3, 14, 42, and 43 under 35 U.S.C. 102(b) over Lee et al. (US 5,835,221) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Lee (US '221) in view of Yang et al. (US 6,599,847 B1).

Applicants traverse the rejection of claims 6 and 13 as being unpatentable over Lee (US '221). In view of Grimbergen (US 6,406,924 B1). Applicants argue Grimbergen's failure to teach an etch endpoint detection process that etches a high-k dielectric layer disposed on a substrate, wherein the pre-selected wavelength in nanometers is greater than or on the order of the initial thickness of the material layer in Angstroms to disclose "wherein the pre-selected wavelength in nanometers is greater than or on the order of the material layer in Angstroms" as recited in claim 1 and "wherein the pre-selected wavelength in nanometers is greater than or on the order of the initial thickness of the gate dielectric layer in Angstroms" as recited in claim 11.

Applicants' argument is acknowledged but is unpersuasive because Lee discloses a substrate surface comprises a 1500 Å (~150 nm) oxide (same as Applicants' high-k dielectric material layer and high-k gate dielectric layer) that is etched. .